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Cost of Capital Study

January 1, 2014

Staff Recommendation

Industry: Product Pipeline Industry			SIC: 2900
Equity:			**Reference**
Risk Adjusted Models			
	CAPM	12.10%	Page 5
Dividend Growth Models			
	DGM or DCF Model (Dividend Growth)	13.00%	Page 7
	DGM or DCF Model (Earnings Growth)	8.75%	Page 7
	DGM or DCF Model (b * ROE = Growth)	16.00%	Page 7
Esimated Cost of Equity Capital		**12.50%**	
Debt:			
Estimated Cost of Debt Capital		**4.00%**	Page 3

Cost of Capital Summary

Capital Component	Market Capital Structure	Cost of Capital	Before-Tax Weighted Average Cost of Capital
Debt	16.00%	4.00%	0.64%
Equity	84.00%	12.50%	10.50%
TOTAL	**100.00%**		**11.14%**
		Rounded	**11.25%**

Cost of Capital Study

January 1, 2014

Staff Recommendation

Industry: Product Pipeline Industry		SIC: 2900
Direct Rate		**Reference**
Equity:		
Esimated Cost of Equity Capital	**9.52%**	Page 8
Debt:		
Estimated Cost of Debt Capital	**5.38%**	Page 9

Cost of Capital Summary

Capital Componen	**Market Capital Structure**	**Cost of Capital**	**Before-Tax Weighted Average Cost of Capital**
Debt	16.00%	5.38%	0.86%
Equity	84.00%	9.52%	8.00%
TOTAL	**100.00%**		**8.86%**
		Rounded	**9.00%**

Cost of Capital Study

January 1, 2014

Analysis of the Market Capital Structure

Analysis of Debt Capital

Industry: Petroleum - Integrated		Ratings	
Company	**Ticker**	**Moody's**	**S&P**
BP PLC ADR	BP	A2	A
Chevron Corp.	CVX	Aa1	AA
Exxon Mobil Corp.	XOM	Aaa	AAA
Hess Corp.	HES	Baa2	BBB
HollyFrontier Corp.	HFC	Baa3	BBB-
Imperial Oil Ltd.	IMO	NR	AAA
Marathon Petroleum	MPC	Baa2	BBB
Murphy Oil Corp.	MUR	Baa3	BBB
Occidental Petroleum	OXY	A1	A
Petroleo Brasileiro ADR	PBR	Baa1	BBB-
Phillips 66	PSX	Baa1	BBB
Royal Dutch Shell 'A'	RDS/A	Aa1	AA
Suncor Energy	SU.TO	Baa1	BBB+
Tesoro Corp.	TSO	Ba1	BB+
Total ADR	TOT	Aa1	AA-
Valero Energy	VLO	Baa2	BBB
Overall Average Debt Rating		**A**	**A**

NR = Not Rated

Ratings Dispersion & Averages			
Agency		Number of Companies	
S&P			
AAA	1	2	2
AA	2	3	6
A	3	2	6
BBB	4	8	32
BB	5	1	5
B	6		
CCC	7		
C	9		
D	10		
Total:		16	51
Average Rating:			3.19
Moody's			
Aaa	1	1	1
Aa	2	3	6
A	3	2	9
Baa	4	8	28
Ba	5	1	5
B	6		
Caa	7		
Ca	8		
C	9		
Total:		15	49
Average Rating:			3.27

Mergent Bond Record, Jan 2013, Page 152				
Corporate	**Aaa**	**Aa**	**A**	**Baa**
October	3.47%	3.63%	3.90%	4.58%
November	3.50%	3.57%	3.87%	4.51%
December	3.65%	3.70%	3.98%	4.63%
Average	**3.54%**	**3.63%**	**3.92%**	**4.57%**
Public Utilities	**Aaa**	**Aa**	**A**	**Baa**
October		3.68%	3.91%	4.54%
November		3.60%	3.84%	4.42%
December		3.75%	4.00%	4.56%
Average		**3.68%**	**3.92%**	**4.51%**
Industrials	**Aaa**	**Aa**	**A**	**Baa**
October	3.47%	3.58%	3.89%	4.62%
November	3.50%	3.54%	3.89%	4.60%
December	3.65%	3.65%	3.96%	4.70%
Average	**3.54%**	**3.59%**	**3.91%**	**4.64%**

Debt Yield Rate Estimate:	4.00%

Rating Sources:
Mergent Bond Record, January 2014;
www.standardandpoors.com;
www.moodys.com

Cost of Capital Study

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Analysis of the Market Capital Structure

Industry: Petroleum - Integrated								**SIC: 2900**
Company Name	**Stock Symbol**	**Debt ($ mil)**	**Debt %**	**Stock Price**	**Shares Outstanding**	**Equity ($ mil)**	**Equity %**	**Total Capital ($ mil)**
BP PLC ADR	BP	38,767.0	22.42%	42.10	3186.6	134,166	77.58%	172,932.5
Chevron Corp.	CVX	12,065.0	4.99%	118.11	1946.7	229,925	95.01%	241,990.4
Exxon Mobil Corp.	XOM	7,928.0	1.93%	89.26	4502	401,858	98.07%	409,785.5
Hess Corp.	HES	7,324.0	22.93%	72.08	341.5	24,617	77.07%	31,940.7
HollyFrontier Corp.	HFC	1,336.2	12.67%	45.22	203.6	9,208	87.33%	10,544.0
Imperial Oil Ltd.	IMO	1,175.0	3.23%	41.59	847.6	35,252	96.77%	36,426.5
Marathon Petroleum	MPC	2,936.6	16.67%	75.43	194.6	14,678	83.33%	17,614.8
Murphy Oil Corp.	MUR	3,342.0	14.69%	58.30	333	19,414	85.31%	22,755.7
Occidental Petroleum	OXY	7,023.0	9.04%	87.70	805.5	70,639	90.96%	77,661.8
Petroleo Brasileiro ADR	PBR	88,570.0	46.45%	15.65	6522.2	102,102	53.55%	190,671.7
Phillips 66	PSX	6,961.0	15.37%	61.47	623.5	38,324	84.63%	45,284.8
Royal Dutch Shell 'A'	RDS/A	36,218.0	15.09%	64.76	3147.7	203,839	84.91%	240,056.7
Suncor Energy	SU.TO	10,203.0	17.62%	32.27	1478.3	47,700	82.38%	57,902.7
Tesoro Corp.	TSO	1,587.0	18.12%	51.81	138.4	7,170	81.88%	8,757.3
Total ADR	TOT	29,402.0	20.05%	51.93	2257.5	117,235	79.95%	146,636.8
Valero Energy	VLO	6,463.0	23.10%	38.96	552.1	21,511	76.90%	27,973.9
Mean:			**16.52%**			**92,352**	**83.48%**	**108,683**
Median:			**16.02%**				**83.98%**	
Market Capital Structure:		**Debt:**	**16.00%**			**Equity:**	**84.00%**	

Stock Price = 2013 Average Closing Price

Data Source: Value Line Investment Survey

Cost of Capital Study

January 1, 2014

Capital Asset Pricing Model (CAPM)

CAPM ==> $K_e = R_f + (\beta * ERP)$

Industry: Petroleum - Integrated	**SIC: 2900**
Risk-Free Rate (R_f)	3.75%
Beta (β)	1.20
Equity Risk Premium (ERP): (R_m - R_f)	6.96%
Adjusted Equity Risk Premium: (β * ERP)	8.35%
Cost of Equity Capital - CAPM	**12.10%**

Ibbotson SBBI 2014 Classic Yearbook	
Long-Term Government Bonds - Income Return[1]	5.90%
Intermediate Term US Treasury Coupon Note Yield (5-Year)[1]	5.40%
Short-Term US Treasury Bill Yield (30-Day)[1]	3.50%
Long-Term US Treasury Coupon Bond Yield (20-Year) [2]	3.67%
Long-Term Horizon Expected Equity Risk Premium [3]	6.96%
(Large Compay Stock Total Return - Long-Term US Government Bond Income)	

[1] Table 2-1: Basic Series, Summary Statistics of Annual Total Returns, Arithmetic Mean, p. 40

[2] Table 11-1: Building Blocks for Expected Return Construction, p. 142

[3] Table 11.4: Long-Horizon Expected Equity Risk Premium, p. 152

Federal Interest Rates - IRS.gov, January 2014 Weighted Average Rates	
Long Term Treasury (30 year) [1]	3.46%
Composite Corporate Bonds [2]	4.69%

[1] http://www.irs.gov/Retirement-Plans/Weighted-Average-Interest-Rate-Table

[2] http://www.irs.gov/Retirement-Plans/Composite-Corporate-Bond-Rate-Table

The ValueLine Investment Survey, Selected Yields, Page 553, January 10, 2014	
U.S. Treasury Securities:	
5-year	1.75%
10-year	3.03%
30-year	3.96%
30-year Zero	4.24%

Federal Reserve Statistical Release (http://www.federalreserve.gov/Releases/H15/20140106/) 1/6/2014	
Treasury constant Maturities:	
5-year	1.73%
10-year	3.01%
20-year	3.69%
30-year	3.93%

Risk-Free Rate of Return R_f Estimate:	**3.75%**

Cost of Capital Study

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Beta (β) Analysis

Industry: Petroleum - Integrated		**SIC: 2900**
Company Name	**Stock Symbol**	**Beta "β"**
BP PLC ADR	BP	1.15
Chevron Corp.	CVX	1.00
Exxon Mobil Corp.	XOM	0.90
Hess Corp.	HES	1.30
HollyFrontier Corp.	HFC	1.25
Imperial Oil Ltd.	IMO	1.05
Marathon Petroleum	MPC	1.20
Murphy Oil Corp.	MUR	1.30
Occidental Petroleum	OXY	1.15
Petroleo Brasileiro ADR	PBR	1.40
Phillips 66	PSX	1.25
Royal Dutch Shell 'A'	RDS/A	1.05
Suncor Energy	SU.TO	1.15
Tesoro Corp.	TSO	1.30
Total ADR	TOT	1.15
Valero Energy	VLO	1.25
Mean:		1.18
Median:		1.18
Beta (β) Estimate:		**1.20**

NMF = Not Meaningful

Data Source: Value Line Investment Survey

Cost of Capital Study

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Dividend Growth Model (DGM or DCF)

DGM or DCF Model ==> $K_e = \dfrac{D_1}{P_0} + g$

where

K_e =	**Cost of Equity**
D_1 =	**Expected Dividends**
P_0 =	**Current Price**
g =	**Sustainable Growth**

Industry: Petroleum - Integrated													**SIC: 2900**
Company Name	**Stock Symbol**	**Stock Price P_0**	**Expected Dividend D_1**	**Dividend Yield (D_1 / P_0)**	**Dividend Growth g**	**Earnings Growth g**	**b**	**ROE**	**g=(b * ROE)**	**(Dividends) K_e**		**(Earnings) K_e**	**g=(b * ROE) K_e**
BP PLC ADR	BP	42.10	2.28	5.42%	9.00%	9.00%	69.52%	14.89%	10.35%	14.42%		14.42%	15.77%
Chevron Corp.	CVX	118.11	4.00	3.39%	6.50%	4.50%	73.86%	18.99%	14.03%	9.89%		7.89%	17.41%
Exxon Mobil Corp.	XOM	89.26	2.64	2.96%	7.50%	6.00%	72.13%	22.53%	16.25%	10.46%		8.96%	19.21%
Hess Corp.	HES	72.08	1.00	1.39%	20.50%	-1.00%	91.44%	9.47%	8.66%	21.89%		0.39%	10.05%
HollyFrontier Corp.	HFC	45.22	1.40	3.10%	0.00%	0.00%	91.57%	28.53%	26.12%	3.10%		3.10%	29.22%
Imperial Oil Ltd.	IMO	41.59	0.52	1.25%	3.50%	6.00%	89.26%	22.62%	20.19%	4.75%		7.25%	21.44%
Marathon Petroleum	MPC	75.43	1.25	1.66%	7.00%	9.00%	73.53%	10.33%	7.60%	8.66%		10.66%	9.25%
Murphy Oil Corp.	MUR	58.30	1.74	2.98%	0.00%	0.00%	87.99%	28.98%	25.50%	2.98%		2.98%	28.48%
Occidental Petroleum	OXY	87.70	2.91	3.32%	9.00%	3.50%	62.99%	14.36%	9.05%	12.32%		6.82%	12.36%
Petroleo Brasileiro ADR	PBR	15.65	0.08	0.51%	9.00%	3.00%	93.44%	6.51%	6.08%	9.51%		3.51%	6.59%
Phillips 66	PSX	61.47	1.59	2.59%	0.00%	0.00%	93.16%	19.85%	18.49%	2.59%		2.59%	21.08%
Royal Dutch Shell 'A'	RDS/A	64.76	3.76	5.81%	3.00%	5.50%	54.49%	9.09%	4.95%	8.81%		11.31%	10.76%
Suncor Energy	SU.TO	32.27	0.92	2.85%	16.00%	12.00%	72.00%	9.49%	6.83%	18.85%		14.85%	9.68%
Tesoro Corp.	TSO	51.81	1.00	1.93%	46.00%	15.50%	94.89%	17.47%	16.58%	47.93%		17.43%	18.51%
Total ADR	TOT	51.93	3.30	6.35%	4.00%	4.00%	56.06%	16.50%	9.25%	10.35%		10.35%	15.60%
Valero Energy	VLO	38.96	1.00	2.57%	19.50%	15.00%	82.72%	11.55%	9.55%	22.07%		17.57%	12.12%
Mean:				3.00%	10.03%	5.75%	78.69%	16.32%	13.09%	**13.03%**		**8.75%**	**16.10%**
Median:				2.90%	7.25%	5.00%	78.29%	15.70%	9.95%	**10.12%**		**8.42%**	**15.69%**
Cost of Equity Capital - DCF K_e Estimate:										**13.00%**		**8.75%**	**16.00%**

NMF = Not Meaningful
b = (1 - payout ratio) = Retention Ratio
ROE = Return on Book Equity
Stock Price = 2013 Average Closing Price

Data Source: Value Line Investment Survey

Support for Market Multiples
Petroleum - Integrated
2014 Assessment Year

Industry Overall				
Company Name	Ticker	$Stock$ Average	Earnings	P/E Multiple
BP PLC ADR	BP	42.10	4.65	9.05
Chevron Corp.	CVX	118.11	11.07	10.67
Exxon Mobil Corp.	XOM	89.26	7.71	11.58
Hess Corp.	HES	72.08	4.54	15.88
HollyFrontier Corp.	HFC	45.22	4.11	11.00
Imperial Oil Ltd.	IMO	41.59	4.35	9.56
Marathon Petroleum	MPC	75.43	4.98	15.15
Murphy Oil Corp.	MUR	58.30	8.82	6.61
Occidental Petroleum	OXY	87.70	7.07	12.40
Petroleo Brasileiro ADR	PBR	15.65	1.91	8.20
Phillips 66	PSX	61.47	6.47	9.50
Royal Dutch Shell 'A'	RDS/A	64.76	5.67	11.42
Suncor Energy	SU.TO	32.27	2.7	11.95
Tesoro Corp.	TSO	51.81	4.6	11.26
Total ADR	TOT	51.93	6.63	7.83
Valero Energy	VLO	38.96	6.03	6.46
Total:		946.64	91.31	
Mean:				**10.53**
Median:				**10.84**
Weighted Mean:				**10.37**
Estimated:				**10.5**
Equity Rate:				**9.52%**

NMF = Not Meaningful

Stock Price = 2013 Average Closing Price

Note: Units per share comparisons

Data Source: ValueLine Investment Survey

Cost of Capital Study

January 1, 2014

Direct Debt Rate Calculation

Industry: Petroleum - Integrated		
Direct Capitalization Debt Rate		
Interest Expense		$ 14,048.5
Total Value of Debt (TVD)		$ 261,300.8
Current Yield = Interest Expense/TVD		**5.38%**

$ (millions)

Data Source: ValueLine Investment Survey